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ABSTRACT

An instrument was developed and tested which would measure intermediate interaction behavior in small-group communication. The study was designed to uncover the several dimensions of such behavior and produce a reliable, valid measure for each dimension that would yield data amenable to parametric statistical analysis. Analysis of two experiments in small-group discussion revealed six main factors: orientation, tension, flexibility, relevance, interest, and verbosity. These factors were chosen for the Intermediate Interaction Behavior Measure (IIBM). Significance tests confirmed the validity of these factors. The IIBM should be useful in measuring either "live" or videotaped interactive behavior. (JK)

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THE DEVELOPMENT OF AN INSTRUMENT FOR MEASURING INTERMEDIATE INTERACTION BEHAVIOR IN SMALL GROUP COMMUNICATION

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THE DEVELOPMENT OF AN INSTRUMENT FOR MEASURING INTERMEDIATE INTERACTION BEHAVIOR IN SMALL GROUPS

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Although many writers have suggested that more research in communication should consider communication as a process, relatively few studies have been reported that have actually measured communication behavior from a process orientation. This is particularly true in the area of small group communication. A partial explanation for this shortcoming in small group research may be that small group researchers in the past have relied too extensively on Bales" (1) Interaction Process Analysis (IPA).

IPA has several major limitations. Gouran (2), for example, has pointed to two major weaknesses: First, Bales' categories are mutually exclusive, a characteristic of the system which prevents a contribution from being classified in more than one way, and which presumes unidimensionality of individual contributions. Second, the system yields data that cannot be subjected to normal parametric statistical analysis.

Leathers (4) has recently reported a new rating-type instrument which he has suggested as ". . . an alternate to product measurement by attempting to measure the immediate effect of different types of contributions on group communication" (4, p. 287). Leathers' approach holds much more promise for measuring communication behavior from a process view than IPA, because it has the potential for overcoming both of the major weaknesses of the IPA system noted above. The Leathers instrument permits raters to respond on semantic differential-type scales to individual interaction behaviors of communicators in a small group on nine "dimensions".

The major problem with the Leathers instrument is that, although he was able to obtain fairly high reliability from his raters, the "dimensions" of the instrument were apparently subjectively determined. No data from factor analysis has been reported to support the existence of these supposed "dimensions".

The purpose of the present study was the development and testing of an instrument for measuring intermediate interaction behavior in small group communication. It was suspected at the outset that such behaviors are multi-dimensional in nature. This study, therefore, was designed to uncover those dimensions and produce a reliable and valid measure for each dimension that would yield data amenable to parametric statistical analysis.

Method

Materials. A thirty minute discussion on the topic "What should the university do about parking in the campus area?" was videotaped. The discussants were five undergraduate students in their first course in small group communication at Illinois State University. Participation by the five discussants was spontaneous

and unrehearsed. The discussants were aware that they were being videotaped, but reported that they did not feel that the videotaping interfered with their normal communication patterns.

A thirty-item, seven-step semantic differential-type instrument was developed. The instrument included the nine items previously employed by Leathers (4). Two items of a similar nature to each of the Leathers items were included. These were added to increase the possibility that each of the Leathers items, in company with the added items, could generate an independent factor from factor analysis, if indeed such a dimension existed. Three additional items of a general nature were added. The items on the instrument were as follows, the Leathers items capitalized:

wordy:short, INFLEXIBLE:FLEXIBLE, uncritical:critical, obstructive:constructive, SIGNAL:SYMBOL, fragmented:whole, task oriented: socially-emotionally oriented, IDEATIONAL:PERSONAL, INVOLVED:WITHDRAWN, feeling response:thinking response, interested:apathetic, logical:non-logical, tangential:goal-bound, bothered: cool, uncompromising:compromising, complete:incomplete, brief:lengthy, disorganized:organized, CLEAR:CONFUSED, unconcerned:concerned, harmful:helpful, related:unrelated, DIGRESSIVE:CONCISE, RELEVANT:IRRELEVANT, concrete:abstract, up tight:calm, unchangeable:changeable, ATOMIZED:UNIFIED, TENSE:RELAXED, ill-defined:well-defined.

Evaluators. There were two phases to the current investigation, the initial phase and the replication. In the initial phase two groups of evaluators were employed. Each group was composed of thirteen students in their first undergraduate course in small group communication. In the replication twelve students in an advanced graduate seminar in small group communication were employed as evaluators. The evaluators received brief training in the use of the instrument before being employed in the study. There was general discussion of the meaning of the terms used on the instrument. A taped discussion, similar to the videotape used in this study, was played so that the evaluators would have practice in use of the instrument. Procedural and semantic problems were covered, as well as other administrative details.

Procedures. Fifteen stimulus statements were randomly selected from the videotaped discussion for the initial phase of the study. A table of random numbers and the tape-distance counter on the video recorder were employed in the selection. The evaluators viewed the videotape until it was stopped immediately after a stimulus statement. Their attention was called to the stimulus statement by rewinding the videotape and replaying the statement. They were asked to complete the evaluation instrument on the basis of the next participation following the stimulus statement (the response).

Two minutes were allotted for the evaluators to complete the instrument after each stimulus-response induction. In every instance the evaluators had ample time to complete the instrument. The total administration time for each group of evaluators was approximately one hour.

The same procedures were followed for both the initial phase of the study and the replication, except that different stimulus statements were selected for the two phases.

Statistical Analysis

The data obtained from the two phases of the study were analyzed separately. In each case the data were first submitted to principle components factor analysis and varimax rotation. The cut-off criterion for rotation was an eigenvalue of 1.0. An item was considered loaded on a given factor if it had a rotated factor loading on that factor of at least .60 and had no rotated loading on another factor higher than .40.

After the factor structure had been determined, the two items with the highest and purest loadings on each of the factors (based on the above criteria) were selected and scored for each evaluator on each of his fifteen responses. The reliability of the evaluators' use of the instrument was examined by means of the analysis of variance procedure proposed by Hoyt and Guilford (3).

Finally, the data were subjected to one-way analysis of variance with repeated measures, the fifteen stimulus-response evaluation points serving as the levels of the independent variable. The data for each factor were analyzed separately.

With twenty-six evaluators each completing the instrument fifteen times, the "N" for the initial phase of the study was 390. The "N" for the replication was 180, twelve raters completing the instrument fifteen times.

Results

Factor analysis indicated the presence of six factors on the instrument in both the initial phase of the study and in the replication. These factors were labeled, on the basis of the content of the items with the highest rotated loadings on the factors, as follows: Orientation, Tension, Flexibility, Relevance, Interest, and Verbosity. Table I reports the items selected for the Intermediate Interaction Behavior Measure (IIBM) and the rotated factor loadings for each item on each factor for both the initial study and the replication.

Analysis of variance reliability estimates were computed separately for the twenty-six raters in the initial phase of the study and for the twelve raters in the replication. The obtained reliability estimates for each factor composed of the two best items on that factor are reported in Table II. The obtained reliability estimates ranged from .64 to .92.

The factor analytic procedure is designed to discover independent dimensions present in an instrument such as the one employed in this investigation. In theory at least, such dimensions should be uncorrelated. To the extent that they are correlated, their independence must be questioned, and their potential usefullness is somewhat reduced. In order to determine how independent the factors obtained in this study were, correlations among the scores on the various factors for each of the two phases of the study were computed. The results of this analysis are reported in Table III. While factors 1, 4, and 5 were significantly intercorrelated, as were factors 2, 4, and 5, the maximum amount of variance on one factor predictable from another factor was only approximately thirty per cent.

The contributions randomly selected for evaluation in this investigation differed markedly as to type and quality. If the IIBM is to be presumed to have any validity as a measure of intermediate interaction behavior, it should reflect those differences. The repeated measures analyses of variance provided a direct

test of the hypothesis that the intermediate interaction behaviors evaluated in this study differed on the six factors of the IIBM. The results of these analyses provided support for that hypothesis for all of the factors except Verbosity. With the exception of this factor, all of the analyses yielded F-ratios that were statistically significant at the .01 level. The results on the Verbosity factor were clearly non-significant ($F < 1.0$).

Discussion

The first purpose of this investigation was to discover the dimensions of intermediate interaction behavior in small group communication. Six dimensions were discovered in the initial investigation and the same six dimensions were observed in the replication. Because the Ss in the initial investigation were comparatively untrained in small group communication theory (only part way through their first course) while the Ss in the replication were highly trained (in their second graduate course), it is reasonable to conclude that the observed dimensions are not the function of instruction in small group communication theory. The IIBM, therefore, can be used by evaluators with either minimal or extensive knowledge of small group communication theory with the expectation that the factor structure in the resulting data will not be affected by this variable. This is particularly important for the researcher who has few or no potential evaluators available who are knowledgeable in small group communication theory.

The second purpose of the present study was the development of a measuring instrument for intermediate interaction behavior in small group communication that would be amenable to parametric statistical analysis. The semantic differential-approach to measurement has been generally accepted by researchers as one which yields data that meets the assumption of intervality required for parametric statistical analysis; hence, this approach was selected.

The resulting instrument was found to have acceptable reliabilities on each of the six factors measured. Since reliability in the use of this type of instrument is closely tied to the number of evaluators using the instrument, the researcher who wishes to improve his reliability of measurement may do so by increasing the number of evaluators he employs. Since people need no special background to be selected as evaluators, and training of evaluators is a brief and simple task, this is a viable procedure.

Validity is always an important question in the development of a measuring instrument. In most cases in the field of communication, there is no absolute criterion against which to compare a newly developed instrument to establish its validity, or lack of same. This instance is no exception. One important check on the validity of a measure is whether the measure can detect differences we know or believe exist. The IIBM was able to detect differences that were believed to exist among the fifteen intermediate interaction behaviors employed in this study. Such differences were observed on five of the six dimensions of the instrument. The single exception was the Verbosity dimension. Since this dimension is primarily concerned with the length of a contribution, if all of the contributions were of about the same length, no difference in Verbosity scores should be expected. Such was the case in the present study.

From the results of this study, therefore, we may conclude that there are six observable dimensions of intermediate interaction behavior in small group

communication and that the IIBM is capable of reliably measuring those dimensions with some presumption of validity. The IIBM permits the researcher to examine the effects of any number of communication variables in small group communication from a process orientation in a way that yields data that can be analyzed by means of any appropriate parametric statistical procedure.

Although the IIBM was developed primarily as a measure of intermediate interaction behavior in intragroup communication, it should be equally applicable to measurement of such behavior in any interpersonal communication setting. One limitation, however, must be stressed. The IIBM was developed in a setting where evaluators could respond to both verbal and nonverbal stimuli provided by communicators. As such, the instrument should be useful for measuring intermediate interaction behaviors either "live" or by means of videotape. The use of audiotape would remove many of the nonverbal stimuli and manuscripting would remove even more. Hence, application of the IIBM in these circumstances must be done with full awareness that some of the dimensions (particularly Tension and Interest) may not be as fully measured as they would be if the live or videotape approach were employed.

References

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2. D. A. Gouran, "Conceptual and Methodological Approaches to the Study of Leadership," Central States Speech Journal, 21 (1970), 222.

3. J. P. Guilford, Psychometric Methods, 2nd ed. (New York, 1954).

4. D. G. Leathers, "Process Disruption and Measurement in Small Group Communication," Quarterly Journal of Speech, 55 (1969) 287-300.

Table I

Intermediate Interaction Behavior Measure

Item	Evaluation Group	Rotated Factor Loadings**					
		Orientation	Tension	Flexibility	Relevance	Interest	Verbosity
Task Oriented: Socially-Emotionally Oriented	Initial	.81*	.06	.01	.31	.17	.00
	Replication	.61*	.00	.06	.39	.22	.11
Ideational:Personal	I	.81*	.03	.10	.19	.01	.17
	R	.78*	.01	.05	.22	.17	.16
Bothered:Cool	I	.08	.75*	.09	.16	.29	.20
	R	.04	.87*	.04	.20	.04	.02
Tense:Relaxed	I	.02	.75*	.18	.24	.18	.14
	R	.09	.82*	.09	.21	.05	.23
Flexible:Inflexible	I	.02	.06	.75*	.07	.21	.15
	R	.22	.00	.79*	.02	.01	.09
Unchangeable:Changeable	I	.07	.12	.67*	.17	.18	.13
	R	.05	.11	.87*	.04	.00	.09
Relevant:Irrelevant	I	.26	.07	.11	.73*	.34	.03
	R	.16	.06	.08	.84*	.25	.09
Related:Unrelated	I	.14	.01	.12	.76*	.39	.07
	R	.26	.15	.05	.76*	.30	.11
Interested:Apathetic	I	.15	.20	.02	.17	.75*	.07
	R	.26	.20	.05	.30	.73*	.06
Involved:Withdrawn	I	.08	.20	.02	.24	.76*	.04
	R	.34	.02	.03	.26	.71*	.00
Wordy:Short	I	.04	.19	.04	.23	.01	.83*
	R	.10	.13	.01	.00	.09	.91*
Brief:Lengthy	I	.04	.20	.03	.20	.07	.88*
	R	.15	.18	.02	.03	.04	.89*

* Highest Loading
** Rounded to two places, sign ignored.

Table II

Evaluator Reliability Estimates

Group	Factor					
	Orientation	Tension	Flexibility	Relevance	Interest	Verbosity
Initial (n=26)	.92	.66	.64	.71	.86	.78
Replication (n=12)	.88	.87	.69	.74	.68	.74

Table III

Interfactor Correlation Matrix

Group	Factor	Factor				
		1	2	3	4	5
Initial (n=390)	2	-.16				
	3	-.03	.08			
	4	.56*	-.34*	-.09		
	5	.52*	-.25*	.01	.58*	
	6	-.06	-.07	-.05	-.04	.06
Replication (n=180)	2	-.14				
	3	-.06	.09			
	4	.46*	-.31*	-.05		
	5	.29*	-.41*	-.02	.50*	
	6	-.01	-.02	.02	-.02	.05

* Correlation significant at .05 level.